

Appl. No. 10/765,791
Amdt. Dated January 8, 2008
Reply to Office Action of November 27, 2007

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. – 91. (Canceled)

92. (Currently Amended) A polishing system ~~comprising a~~ for polishing apparatus and an object to be polished, said system comprising:

~~wherein said an~~ object to be polished ~~includes~~ including a substrate and a film formed over the substrate, and

~~wherein said polishing apparatus comprises:~~

a table for holding the object,

~~a measuring means for measuring data corresponding to a thickness of the film on the object,~~

a cathode member relatively small compared with the upper surface of the film and arranged to face the upper surface of the film,

a measuring means, separate from the cathode member, for measuring data corresponding to a thickness of the film on the object prior to beginning electropolishing,

an electrolytic solution feeding means for feeding an electrolytic solution at least between a region of the upper surface of the film and the cathode member,

a power supply for applying a voltage with the cathode member serving as a cathode and the film serving as an anode,

a moving means for moving the cathode member to other regions of the surface in order to remove the target amount of film over the entire surface of the object, and

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a control means for controlling the application of voltage and the speed of movement of the cathode, based at least in part on the thickness data obtained from said measuring means, until the target amount of film in each region is removed.

93. (Previously Presented) The polishing system as set forth in claim 92, wherein the cathode member is divided into a plurality of regions which are arranged insulated from each other and the cathode member as a whole faces the entire surface portion of the table corresponding to the size of the object to be polished, and

said moving means comprises alternately and sequentially applying a voltage to each of the plurality of regions of the cathode member in order to effectively move the point at which electrolytic polishing occurs.

94. (Currently Amended) The polishing system as set forth in claim 92, further comprising a calculating unit for calculating the target amount of the film to be removed from a thickness data determined prior to beginning the electrolytic polishing, and

wherein said control means controls the speed and voltage of the cathode based on said calculated target amount.

95. (Currently Amended) A plating system ~~comprising a~~ for plating apparatus and an object to be plated, said system comprising:

~~wherein said~~ an object to be plated includes including at least a substrate and an upper surface, and

~~wherein said plating apparatus comprises:~~

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a table for holding the object,

~~a measuring means for measuring surface height data of the surface or thickness data of the plating film on the object,~~

an anode member relatively small compared with the surface of the object and arranged to face a region of the surface,

a measuring means, separate from said anode member, for measuring surface height data of the surface or thickness data of the plating film on the object prior to beginning plating,

an electrolytic plating solution feeding means for feeding an electrolytic plating solution at least between that region of the surface of the object facing the anode and the anode member,

a power supply for applying a voltage with the anode member serving as an anode and the surface of the object as a cathode,

a moving means for moving the anode member to other regions of the surface of the object, and

a control means for controlling the application of voltage and the speed of movement of the anode, based at least in part on the thickness data obtained from said measuring means, until a target amount of the plating film is formed in each region of the surface.

96. (Previously Presented) The plating system as set forth in claim 95, wherein the anode member is divided into a plurality of regions which are arranged insulated from each other and the anode member as a whole faces the entire surface portion of the table corresponding to the size of the object to be polished, and

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said moving means comprises alternately and sequentially applying a voltage to each of the plurality of regions of the anode member in order to effectively move the point at plating deposition occurs.

97. (Currently Amended) The plating system as set forth in claim 95, further comprising a calculating unit for calculating the target amount of the film to be plated from a thickness data determined prior to beginning the plating, and

wherein said control means controls the speed and voltage of the anode based on said calculated target amount.

98. (Currently Amended) The plating system as set forth in claim 95, wherein the anode is continuously moved during electropolishing and the speed of the anode is inversely proportional to the thickness of the deposited plating layer.

99. (Currently Amended) The polishing system as set forth in claim 92, wherein the cathode is continuously moved during electropolishing and the speed of the cathode is inversely proportional to the amount of film to be removed by electrolytic polishing.

100. (Currently Amended) The polishing system as set forth in claim [[92]] 99, wherein the moving means provides for physical lateral movement of the cathode.

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101. (Currently Amended) The plating system as set forth in claim ~~[[95]]~~ 98,
wherein the moving means provides for physical lateral movement of the anode.

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Please add the following new claims:

102. (New) A polishing system for polishing an object to be polished, said system comprising:

an object to be polished including a substrate and a film formed over the substrate,
a table for holding the object,
a cathode member relatively small compared with the upper surface of the film and arranged to face the upper surface of the film,
a measuring means for measuring data corresponding to a thickness of the film on the object,
an electrolytic solution feeding means for feeding an electrolytic solution at least between a region of the upper surface of the film and the cathode member,
a power supply for applying a voltage with the cathode member serving as a cathode and the film serving as an anode,
a moving means for moving the cathode member to other regions of the surface in order to remove the target amount of film over the entire surface of the object,
a calculating unit for calculating the target amount of the film to be removed from a thickness data determined prior to beginning electrolytic polishing, and
a control means for controlling the application of voltage and the speed of movement of the cathode during electropolishing, based at least in part on the calculated target amount from said calculating unit obtained prior to beginning electropolishing, until the target amount of film in each region is removed.

103. (New) The polishing system according to claim 102, wherein said control means controls the application of voltage and speed of movement of the cathode during

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electropolishing based solely on the calculated target amount from said calculating unit obtained prior to beginning electropolishing.

104. (New) The polishing system according to claim 102, wherein the polishing system further comprises an anode member facing the surface of the film and set apart from the cathode member at a certain non-zero distance,

the electrolytic feeding means feeds an electrolytic solution between the region of the surface of the object and the cathode member and between the surface of the object and the anode member, and

the power supply applies a voltage to the cathode member and the anode member.

105. (New) The polishing system according to claim 102, wherein

the polishing system further comprises a polishing means for chemical mechanical polishing and performs the chemical mechanical polishing in that region of the film at the same time as the electrolytic polishing to flatten the film.

106. (New) The polishing system according to claim 102, wherein the power supply applies a rectangular pulse voltage.

107. (New) The polishing system according to claim 102, wherein the power source applies an alternating-current voltage to the cathode member and the anode member.

108. (New) A plating system for plating an object to be plated, said system comprising:

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an object to be plated including at least a substrate and an upper surface, and

a table for holding the object,

an anode member relatively small compared with the surface of the object and arranged to face a region of the surface,

a measuring means for measuring surface height data of the surface or thickness data of the plating film on the object,

an electrolytic plating solution feeding means for feeding an electrolytic plating solution at least between that region of the surface of the object facing the anode and the anode member,

a power supply for applying a voltage with the anode member serving as an anode and the surface of the object as a cathode,

a moving means for moving the anode member to other regions of the surface of the object,

a calculating unit for calculating the target amount of the film to be plated from a thickness data determined prior to beginning plating, and

a control means for controlling the application of voltage and the speed of movement of the anode during plating, based at least in part on the calculated target amount from said calculating unit obtained prior to beginning plating, until a target amount of the plating film is formed in each region of the surface.

109. (New) The plating system according to claim 108, wherein said control means controls the application of voltage and speed of movement of the anode during plating based solely on the calculated target amount from said calculating unit obtained prior to beginning plating.